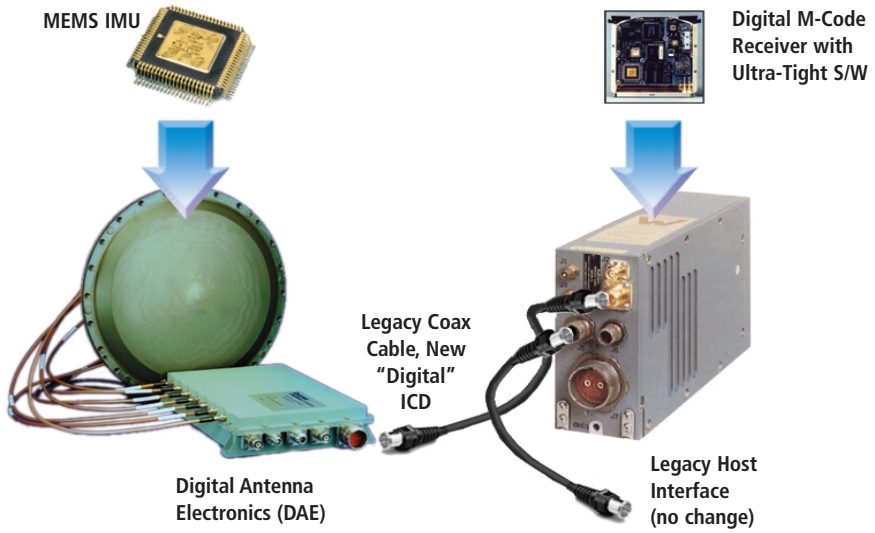
DIGITAL INTERFACE ICD

DESCRIPTION

The digital interface between a Digital Antenna Electronics (DAE) / Micro-Electro-Mechanical Sensor (MEMS) Inertial Measurement Unit (IMU) or (MIMU) subsystem and an "All Digital" GPS M-code receiver is specified in an Interface Control Document (ICD). The primary objective of this ICD is to provide a digital interface definition that will ensure interoperability and interface standardization of future DAEs and digital M-code receivers used in tactical and strategic equipment and subsystems. This digital interface ICD will also provide compatibility among users to help minimize life-cycle costs and enhance supportability. The GPS Joint Program Office (JPO) is currently soliciting inputs from industry on the digital interface ICD.



FEATURES

- Flexibility and configurability "designed in"
- Compatible with existing platform cabling
- Synergistic with DAE (digital output), Digital M-code Receiver and GPS/INS Ultra-Tight Coupling requirements
- Minimizes platform integration costs and maximizes future upgrade potential
- The draft version of the ICD is available now

APPLICATIONS

Digital GPS receivers and antenna subsystems used on military air, sea, ground, and weapons platforms

Msg #	Message	Source/Destination	Message Length	Max Msg Rate
1	SV beam steering message	Digital Receiver to DAE	36 16-bit words	500 Hz
2	Digital Receiver Time-Mark "Soft discrete" message	Digital Receiver to DAE	7 16-bit word	1 Hz
3	Digital Receiver Synchronization "soft discrete" message	Digital Receiver to DAE	7 16-bit word	100 Hz
4	Digitized IF message	DAE to Digital Receiver	1 16 bit word (2-bits / beam)	60 MHz
5	DAE BIT/Mode message	DAE to Digital Receiver	9 16-bit words	50 Hz
6	MIMU TOV "soft discrete" message	DAE to Digital Receiver	7 16-bit word	500 Hz
7	MIMU message	DAE to Digital Receiver	18 16-bit words	500 Hz

Digital ICD Overview

All required data are multiplexed/demultiplexed over existing platform cabling to allow current platforms to gain A/J performance without large host platform integration costs. The Digital M-code Receiver sends beam steering data, commands, and timing and synchronization information to the DAE at a relatively low data rate. In the opposite direction, the DAE sends very high rate, multi-beam, digitized IF data, and lower rate inertial (MIMU) data, BIT results, mode information, and a MIMU Time-of-Validity (TOV) message to the Digital M-code Receiver.

Data Encoding

Manchester modulation is utilized to simultaneously transport the clock and data. This allows the receiver to synchronize with the sender by providing a simple clock that is still active during transmission idle periods. Additionally, the Manchester clock recovered at the DAE can be used to drive the local oscillator for the first down conversion of the GPS RF signal before digitization, eliminating the need for a separate wire.

FOR FURTHER INFORMATION CONTACT:

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